Feb. 20, 1934. W. F. SCHILDMAN 1,948,280

MILK PROCESSING MACHINE

Filed Nov. 12, 1931 3 Sheets-Sheet 1

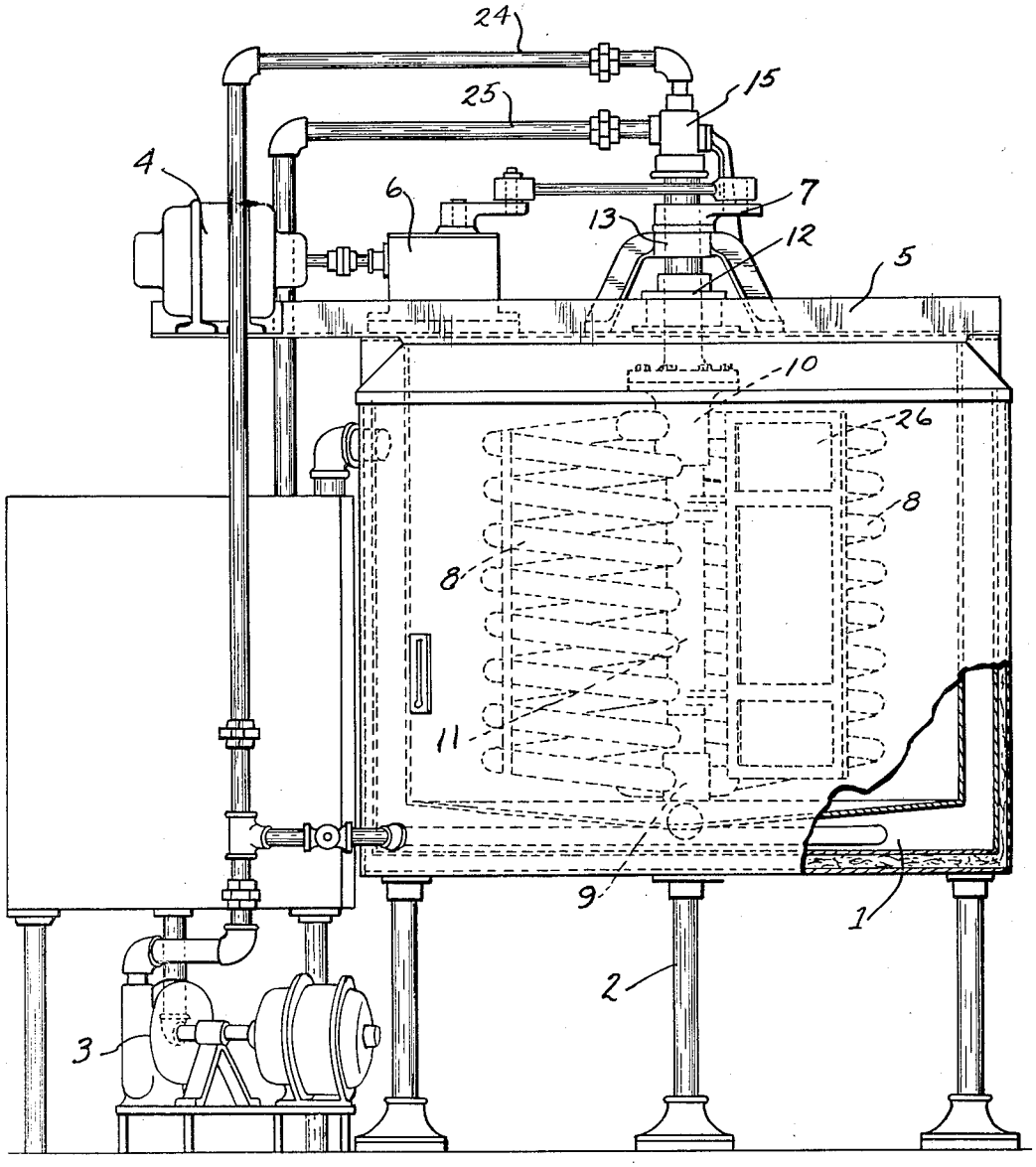


Fig. 1.

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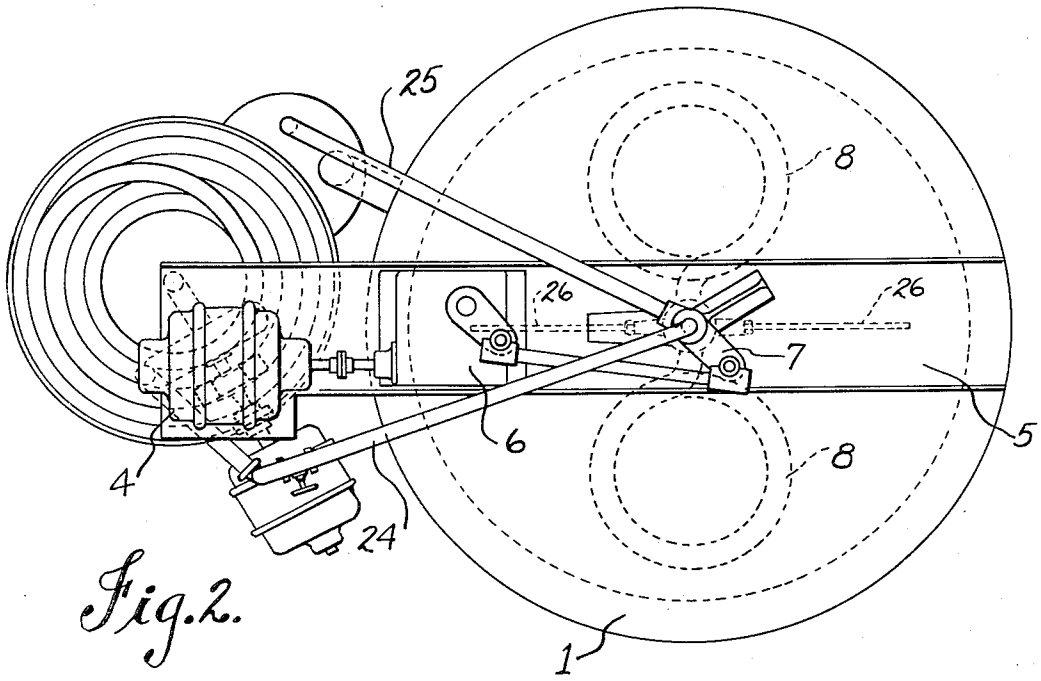


Fig. 2.

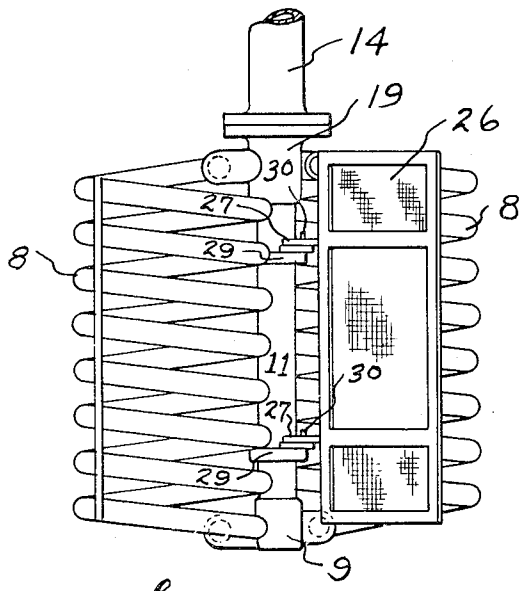


Fig. 3.

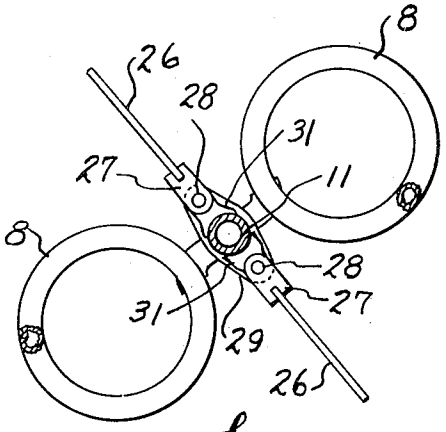


Fig. 4.

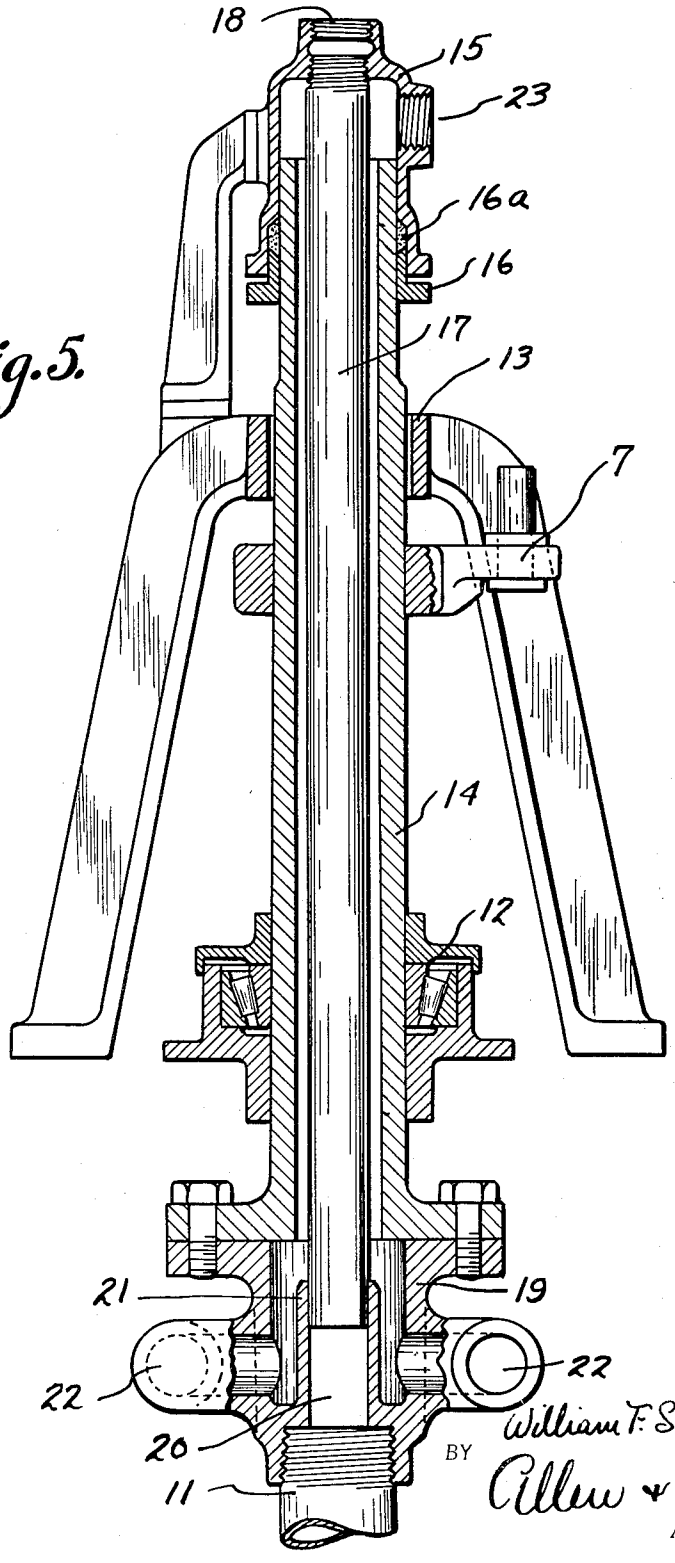
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Fig. 5.



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UNITED STATES PATENT OFFICE

1,948,280

MILK PROCESSING MACHINE

William F. Schildman, Cincinnati, Ohio, assignor to American Copper & Brass Works, Cincinnati, Ohio, a corporation of Ohio

Application November 12, 1931
Serial No. 574,667

11 Claims. (Cl. 257—78)

My invention relates to vertical coils for use in pasteurizers and processing of milk products and other liquids, together with foraminated vanes for attaching thereto.

Pasteurizers usually contain a vertical coil through which fluid is run at a certain predetermined temperature. This coil is used to raise or lower the temperature of the liquid in the pasteurizer as quickly and as uniformly as possible. To accomplish this, the coil is composed of thin metal tubing arranged in a spiral about a central shaft or axis, and is sometimes revolved about the axis so as to stir the liquid. It has been found that the ordinary coil does not stir the liquid sufficiency in revolving.

It is the object of my invention to provide a coil so designed as to give the maximum disturbance to the liquid in the pasteurizer.

In the drawings:—

Figure 1 is a side elevation of my machine.

Figure 2 is a plan view thereof.

Figure 3 is a detail elevation of the coil mechanism.

Figure 4 is a plan view thereof.

Figure 5 is a longitudinal section of the pipe connection.

The illustrated structure, showing a preferred application of my invention, has a receptacle 1, supporting legs 2, with a suitable circulating pump 3. A motor 4 is mounted on a frame part 5 at the top of the receptacle, which motor is connected to a gear box 6. The crank 7, driven from the gear box, has a connecting rod secured thereto, which is used to oscillate the coil.

The coil mechanism in this instance consists of two spiral coils 8, 8, of suitable metal tubing connected together at the bottom by a header 9, and at the top by a header 10. These headers are mounted on a central supporting pipe 11, supported by a bearing 12 that suspends it from the upper end thereof. The bearing 12 is mounted on the frame 5, and the central pipe 11 is braced by means of a collar 13 mounted on a stand which itself is secured to the frame.

The upper header 10 is illustrated in Figure 5. The header consists of a pipe 14 which is mounted on bearing 12, and has crank 7 fastened thereto, and is braced by a collar 13 which is mounted on the bracing stand. This pipe 14 is in reality a prolongation of pipe 11 to which it is fastened by any suitable means. To the upper end of pipe 14 is mounted a casting 15 which is braced to the frame part 5, so that it is stationary. The casting 15 is mounted over the pipe 14 and connected by a pack nut 16 packed with packing 16*a* in such a manner as to permit the pipe 14 to revolve freely in the casting 15. There is a metal tube 17 firmly attached to the casting 15 at the inside of the entrance space 18 in such a manner that fluid passing in through the entrance 18 of the casting 15 will not pass into the casting itself, but will flow through the tube 17. At the lower end of the pipe 14, and fastened firmly to it, is a casting 19. This casting has on opening 20. On the inside of said opening is a prolonged lip 21 constructed to fit over the lower end of tube 17 in such a manner that fluid flowing through tube 17 will not flow into the casting 19, but will flow through the opening 20 into the pipe 11 and down through the head 9 and into the bottom of the coils. There are two openings 22, 22, in the side of casting 19, to which the upper ends of coils 8, 8, are connected. These openings are made into the interior of the casting in such a manner that fluid flowing into them from the upper end of coils 8, 8, will flow up through the inside of pipe 14, but on the outside of tube 17, and so out through opening 23 in the upper casting 15. To the two openings in casting 15 are attached the pipe system 24 and 25. The pump 3 is connected in series with this pipe system in such a manner that a fluid at a predetermined temperature may be continually circulated through the whole system. It will be seen that when the crank 7 is oscillated, the pipe 14 will move, together with the casting 19 and the coils 8, 8, but the casting 15 and tube 17 will remain stationary.

Removable vanes 26, 26, are mounted on the pipe 11. These vanes are of any suitable foraminated construction and are mounted rigidly but removably intermediate the coils. The vanes 26, 26, have two brackets 27, 27, containing holes 28, 28. These brackets fit over two bosses 29, 29, permanently fastened to the pipe 11 and are attached thereto by pins 30, 30. The brackets 27, 27, are so formed as to extend beyond the holes 28, 28, and to form shoulders 31, 31, which fit snugly against the pipe 11 when the vanes are in place, so as to prevent the vanes from swinging on the pins.

When my pasteurizer is in operation, the coil mechanism oscillates back and forth around the central axis and the twin coil construction sets up a very desirable disturbance in the liquid, which, together with the continued flow of fluid at a predetermined temperature through the system, works very efficiently.

The foraminated vanes are found to be es-

pecially efficient in the breaking up of the heavy curd in buttermilk.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character described, the combination with a receptacle, of a vertical, hollow shaft therein, means for oscillating the shaft, and a plurality of helical coils on separate spaced vertical axes connected to the shaft.

2. In a device of the character described, the combination with a receptacle having a solid bottom, of a plurality of coils therein located on a plurality of spaced vertical axes, means for passing fluid through said coils, and means for imparting a rotary motion to said coils around a common axis within the receptacle.

3. In a device of the character described, the combination with a receptacle, of a plurality of helical coils therein located on a plurality of spaced vertical axes, means for passing fluid through said coils, and means for oscillating said coils to and fro around a common axis within the receptacle.

4. In a device of the character described, the combination with a receptacle, of a vertical, hollow shaft therein, means for imparting a rotary motion to said hollow shaft, a plurality of helical coils on separate spaced axes connected to the shaft, and vanes mounted on said hollow shaft intermediate the coils.

5. In a device of the character described, the combination with a receptacle, of a vertical, hollow shaft therein, means for imparting a rotary motion to said hollow shaft, a plurality of coils on separate spaced axes connected to the shaft, and vanes mounted on said hollow shaft intermediate the coils, said vanes being foraminated.

6. In a device of the character described, the combination with a receptacle, of a vertical, hollow shaft therein, means for imparting a rotary motion to said hollow shaft, a plurality of coils on separate spaced axes connected to the shaft, and vanes detachably mounted on said hollow shaft intermediate the coils, said vanes being foraminated.

7. In a device of the character described, the combination with a receptacle, of a plurality of coils therein located on spaced vertical axes, means for passing fluid through said coils, means for imparting a rotary motion to said coils within the receptacle, and vanes mounted on said hollow shaft intermediate the coils.

8. In a device of the character described, the combination with a receptacle, of a plurality of coils therein located on spaced vertical axes, means for passing fluid through said coils, means for imparting a rotary motion to said coils within the receptacle, and vanes mounted on said hollow shaft intermediate the coils, said vanes being foraminated.

9. In a device of the character described, the combination with a receptacle, of a plurality of coils therein located on spaced vertical axes, means for passing fluid through said coils, means for oscillating said coils to and fro within the receptacle, and vanes mounted on said hollow shaft intermediate the coils.

10. In a device of the character described, the combination with a receptacle, of a plurality of coils therein located on spaced vertical axes, means for passing fluid through said coils, means for oscillating said coils to and fro within the receptacle, and vanes mounted on said hollow shaft intermediate the coils, said vanes being foraminated.

11. In a device of the character described, the combination with a receptacle, of a vertical hollow shaft therein, means for imparting an oscillating motion to said shaft, at least two helical coils on separate vertical axis which are separate from each other and separate from said shaft but parallel to said shaft, said coils being on opposite sides of said shaft and equally distanced from said shaft, said coils being immovably connected to said shaft, and means for passing fluid through said shaft and said coils.

WILLIAM F. SCHILDMAN.